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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,938	02/08/2002	Yutaka Matsunobu	381AS/49196DV	8443

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[REDACTED] EXAMINER

VANAMAN, FRANK BENNETT

[REDACTED] ART UNIT

[REDACTED] PAPER NUMBER

3618

DATE MAILED: 11/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 10/067,938	Applicant(s) Matsunobu et al.
Examiner Vanaman	Art Unit 3618



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 2/8/02 (preliminary amendment).
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 2, 5, 7-10, 13, 14, and 17 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 2, 5, 7-10, 13, 14, and 17 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on Feb 8, 2002 is/are a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. 09/654,615.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) Notice of References Cited (PTO-892) 4) Interview Summary (PTO-413) Paper No(s). _____
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) Notice of Informal Patent Application (PTO-152)
- 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s). 5 6) Other: _____

Art Unit: 3618

Status of Application

1. Applicant's preliminary amendment, filed Feb. 8, 2002, has been entered in the application. Claims 2, 5, 7-9, ¹⁰₁₁, 13, 14, and 17 are pending.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119 (a)-(d). The certified copy has been filed in parent Application No. 09/654615, filed on Sept 1, 2000.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore:

(I) the magnet inserting hole and magnet both (a) being at an inclined angle and (b) having an arc shape (claims 13 and 14-- note that these claims depend from claim 5 and include all of claim 5's limitations), and

(II) the magnet and inserting hole being at an inclined angle wherein the width ratio between the magnet and inserting hole is 1: 0.5-0.9 (claim 17),

must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities: on page 14, line 9, "is rotates" should either be --is rotated-- or --rotates--; on page 14, lines 14-15 "the motor is regenerated" is informal; on page 15, line 26, "can about 10% improve" should be --can improve about 10%--. The entire specification should be carefully reviewed for minor informalities.

Appropriate correction is required.

Art Unit: 3618

Claim Objections

5. Claim 5 is objected to because of the following informalities: on line 15, "when reverse moving" is informal. Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. Claims 2, 5, 7-⁹₁₀, 13, 14, and 17 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Throughout the claims, the terms "the reverse rotation" and "the normal rotation" lack a clear antecedent basis, note, for example, claim 2, lines 4 and 5, claim 5, line 16, claim 5, line 20, etc.; in claim 2, lines 4-5 it is not clear whether or not the recitation is a further limitation beyond the recitation of claim 5, lines 15-16; in claims 5, 7, and 8, the inclusions of parenthetical expressions or terms render the claims unclear in that it cannot be determined whether or not these expressions are further narrowing clarifications or limitations, rendering the precise scope unclear; in claim 9, line 3; claim 10, lines 3-4; claim 13, line 3; and claim 14, lines 3-4, the recitation of "in the rotational direction" is confusing in that it is not clear whether or not the reference is to a direction of motion of a motor portion or an axis of rotation--also note claim 17. This has been an exemplary listing. Each and every pending claim should be carefully reviewed and revised for clarity under 35 USC §112, second paragraph.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2, 5, 7, 8, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakatsu (US 4,335,429) in view of Tadahiro et al. (JP 8-33246). Kawakatsu teaches a hybrid electric vehicle having an engine (1) an electric motor (5, 7) connected in series to a drive

Art Unit: 3618

shaft which is then connected to a differential for driving the vehicle wheels, the reference teaching no forward/reverse switching gear.

The reference of Kawakatsu fails to teach the motor as being a permanent magnet machine having a stator, a stator core around which a coil is wound, a rotor arranged in the stator with a plurality of permanent magnets with the rotor being non-symmetrical at each pole, having a magnet accommodating slot which is inclined so as to be at a greater distance from the rotor circumference on a side associated with one rotational direction. The examiner hereby takes official notice that permanent magnet motors are extremely old and well known, and the provision of a stator with a core around which a coil is wound, wherein the stator surrounds a permanent magnet rotor is not at all beyond the skill of the ordinary practitioner, and it would have been obvious to one of ordinary skill in the art at the time of the invention to construct the motors of the vehicle of Kawakatsu with a permanent magnet motor having a stator around which a coil is wound, for the purpose of employing a well known and inexpensive standard motor for operating the vehicle.

The modified reference of Kawakatsu fails to teach the rotor as including a non-symmetric configuration about a protruded pole, wherein a magnet insertion aperture is rectangular, and is inclined so as to favor a rotational direction. Tadahiro et al. teach a motor rotor having a plurality of permanent magnets (4a, 4b) which are installed in rectangular openings (3) which are inclined at an angle of between 10 and 45 degrees, the rotor including a plurality of protruded poles (e.g. A). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the non-symmetric configuration of the magnet insertion openings as taught by Tadahiro et al. to a conventional permanent magnet motor structure usable in the vehicle of Kawakatsu, for the purpose of increasing the operational force which may be exerted by the motor in one rotational direction. Also note that since Kawakatsu teaches motor-only drive in the lowest speed ranges (figure 2), and in that it is well known to provide a vehicle reverse gear with the lowest speed/highest torque relationship, generally a higher torque relationship than even the first

Art Unit: 3618

forward gear, it would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the motor such that a reverse drive direction of the motor would develop higher torque than a forward drive direction for the purpose of controlling the vehicle behavior to mirror a user's expectations based on commonly available vehicle with mechanical transmissions. As regards the particular ratio of forward to reverse torque, it would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the difference in torque to be in the range of 1 : 1.05 - 1.2 for the purpose of setting a forward to reverse torque relationship similar to that known in a mechanical transmission.

9. Claims 13, 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakatsu in view of Tadahiro et al. and Fumio (JP 9-271,151). The references of Kawakatsu and Tadahiro et al. are discussed above, but fail to teach (a) the magnet and magnet insertion openings to be arc shaped and (b) the magnet and magnet insertion opening to have a width ratio of 1: 0.9-0.5. Fumio et al. teach a permanent magnet machine having a stator (20), a stator core (22) around which a coil (24) is wound, a rotor (32) arranged in the stator with a plurality of permanent magnets (36) with the rotor being non-symmetrical at each pole (figures 2, 5), having a magnet accommodating slot (34) of greater width than the magnet, the ratio of slot to magnet length being in the range of 1:0.5-0.9, the slot and magnet having a rectangular (fig. 5) or arc shaped (fig. 2) cross section. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the rotor magnet and insertion openings taught by Kawakatsu as modified by Tadahiro et al. (a) to be arc shaped, for the purpose of adjusting the difference in motor output in the two running directions to be smaller or (b) such that the ratio of magnet width to insertion opening width is in the range of 1:0.5-0.9 for the purpose of adjusting the difference in motor output in the two running directions to be greater.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Brown (US 4,438,362), Fujita et al. (US 4,763,538), Mita et al. (US 5,684,352), Niimi

Art Unit: 3618

(US 5,723,929), Taniguchi et al. (US 5,846,155), and Abe et al. (JP 11-252,838) teach vehicle and motor structures of pertinence.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to F. Vanaman whose telephone number is (703) 308-0424. Any inquiry of a general nature or relating to the status of this application should be directed to the group receptionist whose telephone number is (703) 308-1113.

Any response to this action should be mailed to:

Assistant Commissioner for Patents
Washington, DC 20231

or faxed to :

(703) 305-3597 or 305-7687 (for formal communications intended for entry;
informal or draft communications may be faxed to the same number but should be
clearly labeled "UNOFFICIAL" or "DRAFT")

F. VANAMAN
Primary Examiner
Art Unit 3618

F. Vanaman
November 22, 2002


11/22/02